CLAIMS:

1. A method of operating a gas vane pump including (a) a housing, (b) a rotor rotatably disposed within said housing and cooperating with said housing to define a pump chamber having a dimension in a radial direction of the rotor, which dimension varies in a rotating direction of the rotor, (c) at least one vane held by said rotor movably relative to said rotor and dividing said pump chamber into a plurality of variable-volume chambers, and (d) a lubricant supply passage formed through said housing and said rotor, said lubricant supply passage being closed when said rotor is placed at an angular position relative to said housing, which angular position is outside a predetermined angular range, and opened for communication with an external lubricant supply source when said rotor is placed at an angular position within said predetermined angular range,

characterized in that said vane pump is operated so as to satisfy a condition that when said rotor is stopped at an angular position relative to said housing, which angular position is within said predetermined angular range, a mass of a lubricant remaining in a lowest portion of said pump chamber is divided into a first portion and a second portion, by an initial divider vane which is provided by one of said plurality of vanes.

2. A method according to claim 1, characterized in that a

ratio of a volume of said first portion to a volume of said second portion is within a range between 4 : 1 and 1 : 4.

3. A method according to claim 2, characterized in that said ratio is between 3 : 1 and 1 : 3.

4. A method according to claim 2, characterized in that said ratio is between 2 : 1 and 1 : 2.

5. A method according to claim 2, characterized in that said ratio is between 1.5 : 1 and 1 : 1.5.

6. A method according to any one of claims 1-5, characterized in that said gas vane pump is operable as a vacuum pump.

7. A gas vane pump comprising:

a housing;

a rotor rotatably disposed within said housing and cooperating with said housing to define a pump chamber having a dimension in a radial direction of the rotor, which dimension varies in a rotating direction of the rotor;

at least one vane held by said rotor movably relative to said rotor and dividing said pump chamber into a plurality of variable-volume chambers; and

a lubricant supply passage formed through said housing and said rotor, said lubricant supply passage being

closed when said rotor is placed at an angular position relative to said housing, which angular position is outside a predetermined angular range, and opened for communication with an external lubricant supply source when said rotor is placed at an angular position within said predetermined angular range;

characterized in that a relative position between said lubricant supply passage in an open state thereof and an initial divider vane which is one of said plurality of vanes is determined such that a point of contact of said initial divider vane with an inner circumferential surface of said housing when said rotor is stopped at an angular position relative to said housing, which angular position is in the middle of said predetermined angular range, is located at a lowest point of said pump chamber or at a position adjacent to said lowest point.

8. A gas vane pump according to claim 7, characterized in that the position adjacent to said lowest point of said pump chamber is located within a center angle range of 30° with respect to a center of gravity of an interior space of said housing in cross section in a plane perpendicular to an axis of rotation of said rotor, said lowest point being located in the middle of said center angle range.

9. A gas vane pump according to claim 8, characterized in that said center angle range is 20°.

10. A gas vane pump according to claim 8, characterized in that said center angle range is 10°.

11. A gas vane pump according to claim 8, characterized in that said center angle range is 6°.

12. A gas vane pump according to any one of claims 7-11, characterized in that the position adjacent to said lowest point of said pump chamber is located within a predetermined center angle range with respect to a center of gravity of an interior space of said housing in cross section in a plane perpendicular to an axis of rotation of said rotor, said predetermined center angle range being no more than four times as large as said predetermined angular range of said rotor, said lowest point being located in the middle of said center angle range.

13. A gas vane pump according to claim 12, characterized in that said center angle range is no more than two times as large as said predetermined angular range of said rotor.

14. A gas vane pump according to claim 12, characterized in that said center angle range is no more than said predetermined angular range of said rotor.

15. A method of operating a gas vane pump including (a) a housing, (b) a rotor rotatably disposed within said housing and cooperating with said housing to define a pump chamber

having a dimension in a radial direction of the rotor, which dimension varies in a rotating direction of the rotor, (c) at least one vane held by said rotor movably relative to said rotor and dividing said pump chamber into a plurality of variable-volume chambers, and (d) a lubricant supply passage for introducing a lubricant from an external lubricant supply source into said pump chamber,

characterized in that said rotor is stopped at an angular position relative to said housing, at which a mass of a lubricant remaining in a lowest portion of said pump chamber is divided into a first portion and a second portion, by an initial divider vane which is provided by one of said plurality of vanes, and that when rotation of said rotor is resumed, said first portion is first discharged from said pump chamber by said initial divider vane, and said second portion is then discharged from said pump chamber by a subsequent vane which follows said initial divider vane.

16. A method according to claim 15, characterized in that said lubricant supply passage is formed through said housing and said rotor, and is closed when said rotor is placed at an angular position relative to said housing, which angular position is outside a predetermined angular range, and opened for communication with said external lubricant supply source when said rotor is placed at an angular position within said predetermined angular range, said vane pump being operated so as to satisfy a condition that when

said rotor is stopped at the angular position within said predetermined angular range, said mass of the lubricant remaining in said lowest portion of said pump chamber is divided into said first and second portions by said initial divider vane.